

**P036** Self-assembly of centralspindlin is critical for cytokinesis  
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Microtubule-bundle structures, such as the central spindle and midbody, play critical roles in cytokinesis, from furrow positioning to abscission. Centralspindlin is a protein complex containing a mitotic kinesin and a Rho-family GAP (C.e. ZEN-4/CYK-4; Dm Pav/Tum; H.s. MKLP1(CHO1)/MgcRacGAP) that is essential for the formation of these microtubule-based structures. We previously reported that the affinity of ZEN-4 for microtubules is significantly lower than that of other kinesin motor proteins raising the question of how centralspindlin can stably localize in dividing cells. We have found that centralspindlin self-associates under physiological conditions. Further, we found that the kinesin subunit ZEN-4 contains a small region at the C-terminal end of its predicted coiled coil that is essential for self-assembly. Mutant versions of ZEN-4, deficient specifically in self-assembly by deletion of this region, were defective in microtubule-organization *in vitro* and in cytokinesis in *C. elegans* embryos. Self-assembly-defective ZEN-4 failed to accumulate to the midbody. *In vitro* single molecule observations showed that self-assembly is essential for highly-processive motility of ZEN-4 along microtubules. We will discuss a potential role of this “self-assembly-assisted processivity” in the dramatic accumulation of centralspindlin to the central spindle/midbody.